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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/513,396	02/25/2000	Jiong Chen	AIBT-9901	7302

7590 08/30/2002
Bo-In Lin
13445 Mandoli Drive
Los Altos Hills, CA 94022

EXAMINER

GURZO, PAUL M

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 08/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/513,396

Applicant(s)

CHEN ET AL.

Examiner

Paul Gurzo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claims 9 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 9, a "range" of pressures is claimed, but there is only one value that is given. Please provide addition values for a range or insert --value-- in the place of "range." Appropriate correction is required.

Regarding claim 16, it is unclear what "low" in line 2 describes. If it describes the energy level please specify. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily

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published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-6, 10-12 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Adibi et al. (5,883,391).

Regarding claims 1-6, Adibi et al. teach an ion implantation apparatus that contains a holder for a target substrate to be implanted and an ion source chamber that generates an ion beam (col. 3, lines 23-24). They teach the use of a beam deceleration means that provides a deceleration electric field that reduces the energy of the ion beam (col. 2, lines 34-39). They also teach the blocking of neutralized particles in a mass selection chamber that prevents them from reaching the target for implantation. These neutralized particles propagate and will continue to fly in the direction of the beam ion and will be absorbed in the mass selection chamber, thus blocking them from being steered towards the target chamber (col. 7, lines 50-57). Adibi et al. teach the use of an analyzer magnet that resolves the ion beam according to mass (col. 4, lines 24-26). An electrostatic focusing field is established by applying a potential to a cylindrical electrode (col. 7, lines 1-5). This field is used to steer the neutralized particles in a different direction than the targeted ion beam path as describes above. They teach that a potential is applied to the field electrode thus generating a negative electric field that decelerates the ion beam (col. 6, lines 66-67 and col. 7, lines 50-57).

Regarding claims 10-12 and 15, Adibi et al. teach a beam deceleration means as stated above, and a beam steering means for separating the neutralized particles from the ion beam and propagating those particles in a direction that is different than the targeted ion beam. They also teach an ion beam collector, positioned downstream, that serves as a

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beam stop (col. 4, lines 38-41). They teach a means for blocking the neutralized particles from reaching the implantation target as described above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-9 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adibi et al as applied above, and further in view of Dawson et al. (6,111,260).

Regarding claims 7-8, 13, and 20, Adibi et al. teach an ion beam steering means as described above, but fail to teach a small, deflected angle relative to the horizontal axis. However, Dawson et al. teach steering the ion beam in the direction of the wafer target that is offset approximately 5 to 10 degrees relative to the horizontal axis for scanning thereof (col. 7, lines 4-9). In view of Dawson et al. and ordinary skill in the art, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this beam spread for the purpose of steering the ion beam toward the target so that implantation can occur without including the neutralized particles.

Regarding claim 9, the above applied prior art makes use of a cryo-pump, but does not specify the pressure range of the chamber or the claimed ion beam energy levels. However, the teachings read on the claimed limitation, since one skilled in the art would

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reasonably estimate the pressure range be such so that the desired implantation will occur as claimed.

In addition, Dawson et al. teach a target chamber maintained at a pressure that is less than 10^{-6} Torr (col. 7, lines 1-2). Dawson et al. also teach that ion energy levels from 15 - 40 keV can be controlled (col.4, lines 40-41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a target chamber with a vacuum of 10^{-5} Torr and an ion beam energy level as low as 200 eV so proper implantation will occur.

Regarding claims 14 and 16-19, the prior art discloses the claimed invention except for the appropriate beam-height to beam-width ratio. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an ion beam with the necessary height to width ratio for proper implantation, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Gurzo whose telephone number is (703) 306-0532. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on (703) 308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

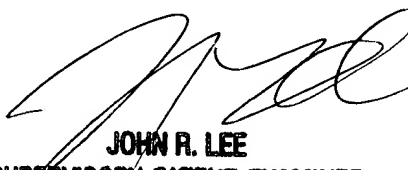
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

P.M.G.

PMG

August 20, 2002



JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800